by the second-chance idle mode, the pass/fail analysis begins after an elapsed time of ten seconds (mt=10). A pass or fail determination is made for the vehicle and the mode is terminated in accordance with paragraphs (d)(2)(iii) (A) through (D) of this section.

(A) The vehicle passes the high-speed mode and the test is immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), measured values are less than or equal to 100 ppm HC and 0.5 percent CO.

(B) The vehicle passes the high-speed mode and the test is terminated if at the end of an elapsed time of 30 seconds (mt=30) if, prior to that time, the criteria of paragraph (d)(2)(iii)(A) of this section are not satisfied, and the measured values are less than or equal to the applicable short test standards as determined by the procedure described in paragraph (a)(2) of this section.

(C) The vehicle passes the high-speed mode and the test is immediately terminated if, at any point between an elapsed time of 30 seconds (mt=30) and 180 seconds (mt=180), the measured values are less than or equal to the applicable short test standards as determined by the procedure described in paragraph (a)(2) of this section.

(D) The vehicle fails the high-speed mode and the test is terminated if none of the provisions of paragraphs (d)(2)(iii) (A), (B), and (C) of this section is satisfied by an elapsed time of 180 seconds (mt=180).

(iv) In the case where the second-chance high-speed mode is followed by the second-chance idle mode, the pass/fail analysis begins after an elapsed time of ten seconds (mt=10). A pass or fail determination is made for the vehicle and the mode is terminated in accordance with paragraphs (d)(2)(iv)(A) and (B) of this section.

(A) The vehicle passes the high-speed mode and the mode is terminated at the end of an elapsed time of 180 seconds (mt=180) if any measured values are less than or equal to the applicable short test standards as determined by the procedure described in paragraph (a)(2) of this section.

(B) The vehicle fails the high-speed mode and the mode is terminated if paragraph (d)(2)(iv)(A) of this section is not satisfied by an elapsed time of 180 seconds (mt=180).

(3) *Second-chance preconditioning mode.* The mode timer starts (mt=0) when engine speed is between 2200 and 2800 rpm. The mode continues for an elapsed time of 180 seconds (mt=180). If the engine speed falls below 2200 rpm or exceeds 2800 rpm for more than five seconds in any one excursion, or 15 seconds over all excursions, the mode timer resets to zero and resumes timing.

(4) *Second-chance idle mode*—(i) *Ford Motor Company and Honda vehicles.* The engines of 1981–1987 model year Ford Motor Company vehicles and 1984–1985 model year Honda Preludes must be shut off for not more than ten seconds and then restarted. The probe may be removed from the tailpipe or the sample pump turned off if necessary to reduce analyzer fouling during the restart procedure. This procedure may also be used for 1988–1989 model year Ford Motor Company vehicles but may not be used for other vehicles.

(ii) The mode timer starts (mt=0) when the vehicle engine speed is between 350 and 1100 rpm. If the engine speed exceeds 1100 rpm or falls below 350 rpm the mode timer resets to zero and resumes timing. The minimum second-chance idle mode length is determined as described in paragraph (d)(4)(iii) of this section. The maximum second-chance idle mode length is 90 seconds elapsed time (mt=90).

(iii) The pass/fail analysis begins after an elapsed time of ten seconds (mt=10). A pass or fail determination is made for the vehicle and the mode is terminated in accordance with paragraphs (d)(4)(iii) (A) through (D) of this section.

(A) The vehicle passes the second-chance idle mode and the test is immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), measured values are less than or equal to 100 ppm HC and 0.5 percent CO.

(B) The vehicle passes the second-chance idle mode and the test is terminated at the end of an elapsed time of 30 seconds (mt=30) if, prior to that time, the criteria of paragraph (d)(4)(iii)(A) of this section are not satisfied, and the measured values are less than or equal to the applicable short

test standards as determined by the procedure described in paragraph (a)(2) of this section.

(C) The vehicle passes the second-chance idle mode and the test is immediately terminated if, at any point between an elapsed time of 30 seconds (mt=30) and 90 seconds (mt=90), measured values are less than or equal to the applicable short test standards described in paragraph (a)(2) of this section.

(D) The vehicle fails the second-chance idle mode and the test is terminated if none of the provisions of paragraphs (d)(4)(iii) (A), (B), and (C) of this section is satisfied by an elapsed time of 90 seconds (mt=90).

[58 FR 58411, Nov. 1, 1993]

§§ 85.2221–85.2223 [Reserved]

§ 85.2224 Exhaust analysis system—EPA 81.

(a) Applicability. The requirements of this subsection apply to short tests conducted under Emissions Performance Warranty through December 31, 1993. The requirements of § 85.2225 apply concurrently until December 31, 1993, after which the requirements of § 85.2225 are solely in effect. The following exceptions apply: In a state where the Administrator has approved a SIP revision providing for implementation of a basic centralized program meeting the requirements of part 51, subpart S of this chapter, according to the schedule specified in § 51.373 of this chapter, the requirements of this section are concurrently in effect until June 30, 1994 for 1995 and earlier model year vehicles or engines; in a state where the Administrator has approved a SIP revision providing for implementation of an enhanced program meeting the requirements of part 51, subpart S of this chapter, according to the schedule specified in § 51.373 of this chapter, the requirements of this section are concurrently in effect until December 31, 1995 for 1995 and earlier model year vehicles or engines.

(b) *Sampling system*—(1) *General requirements.* The exhaust sampling system shall consist of a sample probe, moisture separator and analyzers for HC and CO.

(2) *Dual sample probe requirements.* If used, a dual sample probe must provide equal flow in each leg. The equal flow criterion is considered to be met if the flow rate in each leg of the probe (or an identical model) has been measured under two sample flow rates (the normal rate and a rate equal to the onset of low flow), and if the flow rates in each of the legs are found to be equal to each other (±15%).

(c) *Analyzers*—(1) *Accuracy.* The HC analyzer shall have an accuracy of ±15 ppm at 200 to 220 ppm concentration HC (as hexane). The CO analyzer shall have an accuracy of ±0.1% CO from 1.0% to 1.2% concentration.

(2) *Response time.* Response time of the analyzers shall be 15 seconds to 95% of the final reading.

(3) *Drift.* Analyzer drift (up-scale and down-scale zero and span wander) shall not exceed ±0.1% CO and ±15 ppm HC (as hexane) on the lowest range capable of reading 1.0% or 200 ppm HC (as hexane) during a one-hour period.

[49 FR 24323, June 12, 1984. Redesignated and amended at 58 FR 58403, 58412, Nov. 1, 1993]

§ 85.2225 Steady state test exhaust analysis system—EPA 91.

(a) *Special calendar and model year applicability.* The requirements of § 85.2224 apply concurrently for tests conducted under Emission Performance Warranty on 1995 and earlier model year vehicles or engines until December 31, 1993, after which the requirements of this section are solely in effect. The following exceptions apply: in a state where the Administrator has approved a SIP revision providing for implementation of a basic centralized program meeting the requirements of part 51, subpart S of this chapter, according to the schedule specified in § 51.373 of this chapter, the requirements of § 85.2224 are concurrently in effect until June 30, 1994, for 1995 and earlier model year vehicles or engines; in a state where the Administrator has approved a SIP revision providing for implementation of an enhanced program meeting the requirements of part 51, subpart S of this chapter, according to the schedule specified in § 51.373 of this chapter, the requirements of § 85.2224 are concurrently in effect until December 31, 1995,

for 1995 and earlier model year vehicles or engines.

(b) *Sampling System.*—(1) *General requirements.* The sampling system for steady state short tests consists, at a minimum, of a tailpipe probe; a flexible sample line; a water removal system; particulate trap; sample pump; flow control components; tachometer or dynamometer; analyzers for HC, CO, and CO2; and digital displays for exhaust concentrations of HC, CO, and CO2; and for engine rpm. Materials that are in contact with the gases sampled may not contaminate or change the character of the gases to be analyzed, including gases from alcohol-fueled vehicles. The probe must be capable of being inserted to a depth of at least ten inches into the tailpipe of the vehicle being tested or into an extension boot, if one is used. A digital display for dynamometer speed and load must be included if the test procedures described in §85.2217 or §85.2219 are conducted. Minimum specifications for optional NO analyzers are also described in this section. The analyzer system must be able to test, as specified in §§85.2213, 85.2215, 85.2217, 85.2218, 85.2219, and 85.2220 all model vehicles in service at the time of sale of the analyzer.

(2) *Temperature operating range.* The sampling system and all associated hardware must be of a design certified to operate within the performance specifications described in paragraph (c) of this section in ambient air temperatures ranging from 41 to 110 °F. The analyzer system must, where necessary, include features to keep the sampling system within the specified range.

(3) *Humidity operating range.* The sampling system and all associated hardware must be of a design certified to operate within the performance specifications described in paragraph (c) of this section at a minimum of 80 percent relative humidity throughout the required temperature range.

(4) *Barometric pressure compensation.* Barometric pressure compensation must be provided. Compensation is made for elevations up to 6000 feet (above mean sea level). At any given altitude and ambient conditions specified in paragraphs (b) (2) and (3) of this section, errors due to barometric pressure changes of ±2 inches of mercury may not exceed the accuracy limits specified in paragraph (c) of this section.

(5) *Dual sample probe requirements.* When testing a vehicle with dual exhaust pipes, a dual sample probe of a design certified by the analyzer manufacturer to provide equal flow in each leg must be used. The equal flow requirement is considered to be met if the flow rate in each leg of the probe has been measured under two sample pump flow rates (the normal rate and a rate equal to the onset of low flow), and if the flow rates in each of the legs are found to be equal to each other (within 15 percent of the flow rate in the leg having lower flow).

(6) *System lockout during warmup.* Functional operation of the gas sampling unit must remain disabled through a system lockout until the instrument meets stability and warmup requirements. The instrument is considered ''warmed up'' when the zero and span readings for HC, CO, and CO_2 have stabilized, within ±3 percent of the full range of low scale, for five minutes without adjustment.

(7) *Electromagnetic isolation and interference.* Electromagnetic signals found in an automotive service environment may not cause malfunctions or changes in the accuracy in the electronics of the analyzer system. The instrument design must ensure that readings do not vary as a result of electromagnetic radiation and induction devices normally found in the automotive service environment, including high energy vehicle ignition systems, radio frequency transmission radiation sources, and building electrical systems.

(8) *Vibration and shock protection.* System operation must be unaffected by the vibration and shock encountered under the normal operating conditions encountered in an automotive service environment.

(9) *Propane Equivalency Factor.* The Propane Equivalency Factor must be displayed in a manner that enables it to be viewed conveniently, while permitting it to be altered only by personnel specifically authorized to do so.

(c) *Analyzers*—(1) *Accuracy.* The analyzers must be of a design certified to